

Remarks/Arguments:

The present invention relates to a power supply apparatus. Specifically, the power supply comprises a diode for discharging a capacitive load.

On page 2, the Official Action objects to claims 7, 8, 10-13, 15 and 16, because the recitation of "the diode" does not have sufficient antecedent basis. These claims have been amended to recite "discharge diode" in order to clarify that the recited diode is for discharging the capacitive load. Withdrawal of the objection is respectfully requested.

On page 4, the Official Action rejects claims 1, 2, 4, 5, 9 and 14 under 35 U.S.C. § 203(a) as being unpatentable over the admitted prior art (AAPA) as shown in Fig. 4, in view of Campbell (U.S. Patent No. 3,577,040), Beck (U.S. Patent No. 3,986,099), Podobinski (U.S. Patent No. 4,544,978) or Fabianowski (U.S. Patent No. 4,942,494). It is respectfully submitted, however, that the claims are patentable over the art of record for the reasons set forth below.

Campbell, Beck, Podobinski and Fabianowski teach circuits wherein a free-wheeling diode is placed in parallel with an **inductive load**. The **voltage spike** that is produced by the inductive load when the power supply is turned off, is conducted through the free-wheeling diode thus protecting the rest of the circuit.

Applicants' invention, as recited by claim 1, includes a feature which is neither disclosed nor suggested by the art of record, namely:

...a discharge diode connected between the first and second output terminals of the rectifier...wherein the first and second output terminals are connected with a load charged with an electric charge...

Claim 1 relates to a conventional diode that is placed in parallel to a **capacitive load** that maintains a **charge**. Specifically, as the power supply is turned off, the capacitive load discharges through the diode. This feature is found in at least Figs. 1-3 and pages 4-6 of the specification. No new matter has been added.

On page 6, the Official Action states that it would be obvious to combine AAPA with the free-wheeling diode as taught by Campbell, Beck, Podobinski and Fabianowski. Applicants respectfully disagree with this prior art combination. Specifically, the diodes as taught by the art of record, are in parallel with an **inductive load** and thus acts as a free-wheeling diode. A free-wheeling diode is placed in parallel with an inductive load to eliminate a voltage spike produced by the inductive load when the voltage supply is suddenly turned off. The voltage spike produced by the inductive load will then conduct through the free-wheeling diode. For example, this feature is discussed by Podobinski in Column 8, lines 54-64 ("such device as free wheeling diode 70 is desirable if an **inductive load** is connected to the circuit of the present invention. Free wheeling diode 70 and circuit 10 would desirably provide, under overload conditions, an alternate path for the current circulation to discharge the stored energy in the **magnetic field** of the load and to substantially prevent such stored energy from being discharged through rectifier bridge 16"). Thus, the diode as taught by the art of record is utilized because the inductive load produces a voltage spike.

Applicants' claim 1 is different than the art of record, because the diode is placed in parallel with a **capacitive load** in order to perform discharging ("a discharge diode connected between the first and second output terminals of the rectifier...when the first and second output terminals are connected with a load charged with an electric charge"). This feature is supported on page 5, lines 1-7, in the specification ("this negative potential turns on diode 10 and causes the electric charge stored in the chargeable body 7 to discharge through diode 10 to ground. This prevents a current from flowing through rectifier diode 8, thereby avoiding to prevent power source device 1 from starting operation."). Specifically, in one example as shown in Fig. 1, chargeable body 7 is a roller in a laser printer. Chargeable body 7 is charged by the DC voltage supply, and thus maintains an **electric charge** similar to a capacitor (it is a capacitive load). When the power supply is turned off, the charge stored in chargeable body 7 discharges through diode 10 (rather than discharging through the windings 203 of the transformer). In contrast, the art of record utilizes an inductive load which is different than the capacitive load. Capacitive loads are charged with an electric charge, whereas inductive loads store energy in the form of a magnetic field (not an electric charge). It is conventional to put a diode in parallel with an inductive

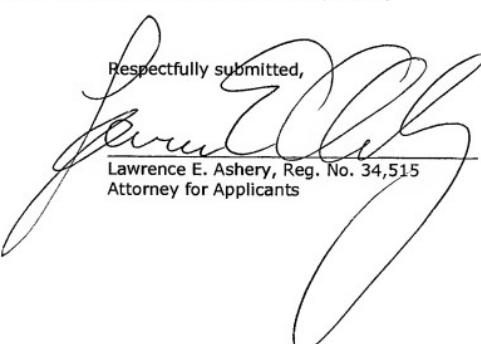
load (as taught by the art), however, it is not conventional to put a diode in parallel with a capacitive load (because capacitive loads do not produce voltage spikes). Thus, it would not be obvious to combine the free-wheeling diodes connected in parallel with the inductive loads as taught by the art of record, with the capacitive load as shown in AAPA.

It is because Applicants include the feature of "*a discharge diode connected between the first and second output terminals of the rectifier...wherein the first and second output terminals are connected with a load charged with an electric charge*", that the following advantages are achieved. An advantage is the ability for the capacitive load to discharge through the diode rather than the power source. Accordingly, for the reasons set forth above, claim 1 is patentable over the art of record.

Claim 4 has similar features to claim 1. Thus, claim 4 is also patentable over the art of record for the reasons set forth above.

Dependent claims 2, 3 and 5-16 include all the features of the independent claims from which they depend. Thus, claims 2, 3, and 5-16 are also patentable over the art of record for the reasons set forth above.

In view of the amendments and arguments set forth above, the above-identified application is in condition for allowance which action is respectfully requested.

Respectfully submitted,

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Dated: July 11, 2008

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NM287581